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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,274	06/11/2002	Kaoru Maekawa	P 290685	1701
909	7590	06/17/2004	EXAMINER	
PILLSBURY WINTHROP, LLP P.O. BOX 10500 MCLEAN, VA 22102			DOAN, THERESA T	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,274

Applicant(s)

MAEKAWA ET AL.

Examiner

Theresa T Doan

Art Unit

2814

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/02/04 has been entered. An action on the RCE follows.

The amendment filed on 05/06/04 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9 and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Shu et al. (U.S. Pat. 5,972,803).

Regarding claims 1, 8-9, 21 and 25-26, Shu (figures 1-5) discloses a method of fabricating a semiconductor device, comprising:

forming a first insulation film 22 on a substrate 10 by a spin-on process (see figure 5, column 2, lines 62-67);

applying a first curing process to the first insulation film at a temperature of 380 - 500°C (column 1, lines 44-52) over duration of 5 - 180 seconds (column 2, lines 62-67 and column 3, lines 1-2);

forming a second insulation film 24 directly on the first insulation film 22 by a spin-on process (see figure 5, column 3, lines 6-7); and

applying a second curing process to the first insulation film and the second insulation film (column 3, lines 6-15).

Regarding claims 2, 5 and 22, Shu (figure 5) discloses wherein the first and second insulation films comprise an organic material having a specific dielectric constant of 3.0 or less (column 1, lines 42-43 and column 3, lines 15-26).

Regarding claims 3-4, 6-7 and 23-24, Shu (figure 5) discloses wherein the first and second insulation films are formed of a spin-on film selected from the group consisting of an organic SOG film (column 2, lines 10-12 and column 3, lines 15-26).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 10 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shu et al. (U.S. Pat. 5,972,803).

Shu (figures 1-5) discloses a method of fabricating a semiconductor device, comprising:

forming a first insulation film 22 on a substrate 10 by a spin-on process (see figure 5, column 2, lines 62-67);

applying a curing process to the first insulation film at a temperature of 380 - 500°C (column 1, lines 44-52) over duration of 5 - 180 seconds (column 2, lines 62-67 and column 3, lines 1-2);

forming a second insulation film 24 on the first insulation film 22 by a spin-on process (see figure 5, column 3, lines 6-7).

Shu does not disclose an intermixing layer between the first and second films. However, one skilled in the art would recognize that an intermixing layer would be formed between the first and second films of Shu by the chemical reaction because Shu's curing process is substantially identical to the claimed curing process (i.e., the curing process as discussed above, see column 2, lines 62-67 and column 3, lines 1-2)

6. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shu et al. (U.S. Pat. 5,972,803) in view of Watatani (U.S. Pat. 6,153,511) as previously cited.

Regarding claims 11, 13-14 and 16-19, Shu (figures 1-5) discloses a method of fabricating a semiconductor device, comprising:

forming a first insulation film 22 on a substrate 10 by a spin-on process (see figure 5, column 2, lines 62-67);

applying a first curing process to the first insulation film at a temperature of 380 - 500°C (column 1, lines 44-52) over duration of 5 - 180 seconds (column 2, lines 62-67 and column 3, lines 1-2);

forming a second insulation film 24 directly on the first insulation film 22 by a spin-on process (see figure 5, column 3, lines 6-7);

applying a second curing process to the first insulation film and the second insulation film (column 3, lines 6-15).

Shu does not teach the step of patterning the second insulation film to form an opening and etching the first insulation film while using the second insulation film as a mask. However, Watatani (in figures 5D-5G) teaches the steps of patterning the second organic SOG insulation film 78 to form an opening 93 (see figures 5D-5E) and etching the first insulation film 74 while using the second insulation film 78 as a mask (figures 5F-5G, column 7, lines 4-42). Given the above teaching, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Shu's device by forming the contact hole with the steps of patterning and etching as set forth above because as taught by Watatani, such modification would provide the interconnection from contact holes.

Regarding claims 12 and 15, Shu (figure 5) discloses wherein the first and second insulation films comprise an organic material having a specific dielectric constant of 3.0 or less (column 1, lines 42-43 and column 3, lines 15-26).

Regarding claim 20, as so far discussed in claim 10 above, Shu does not teach the step of patterning the second insulation film to form an opening and etching the first insulation film while using the second insulation film as a mask. However, Watatani (in figures 5D-5G) teaches the steps of patterning the second organic SOG insulation film 78 to form an opening 93 (see figures 5D-5E) and etching the first insulation film 74 while using the second insulation film 78 as a mask (figures 5F-5G, column 7, lines 4-42). Given the above teaching, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Shu's device by forming the contact hole with the steps of patterning and etching as set forth above because as taught by Watatani, such modification would provide the interconnection from contact holes.

Response to Arguments

Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T Doan whose telephone number is (571) 272-1704. The examiner can normally be reached on Monday to Thursday from 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

TD
June 8, 2004.



PHAT X. CAO
PRIMARY EXAMINER